HISTORIC PROPERTY INVENTORY FORM

State of Washington, Department of Community Development
Office of Archaeology and Historic Preservation
111 21st Avenue Southwest, Post Office Box 48343
Olympia, Washington 98504-8343 (206)753-4011

IDENTIFICATION SECTION

Field Site No. 181-B **OAHP No.** _____ **Date Recorded** 26 April 1995
Site Name Historic River Pump House Revised 29 May 1998
Common _____
Field Recorder M.E. Crist, E.M. Simpson, S.M. Quinn, W.S. White, I.C. Lindsay, J.K. Keating
Owner's Name U.S. Department of Energy, Richland Operations Office
Address P.O. Box 550
City/State/Zip Code Richland, WA 99352

Status

- [x] Survey/Inventory
- [ ] National Register
- [ ] State Register
- [ ] Determined Eligible
- [ ] Determined Not Eligible
- [ ] Other (HABS, HAER, NHL)
- [ ] Local Designation

Photography
Photography Neg. No. HCRL: Roll 154, Frames 10-13; Roll 200, Frames 22-25; Hanford Photo Lab: 95070001-4cn, -6c
(Roll No. & Frame No.)
View of All exterior facades
Date 1995

Photo at right: Neg. No. 95070001-6cn
View of south facade.

Classification [ ] District [ ] Site [x] Building [ ] Structure [ ] Object
District Status [x] NR [ ] SR [ ] LR [ ] INV
Contributing [x] **Non-Contributing** [ ]
District/Thematic Nomination Name Hanford Site Manhattan Project and Cold War Era Historic District

Description Section
Materials & Features/Structural Types
Building Type Industry
Plan Rectangular
Structural System Reinforced concrete and concrete block
No. of Stories One

Roof Type

- [ ] Gable
- [ ] Hip
- [x] Flat
- [ ] Pyramidal
- [ ] Monitor
- [ ] Other (specify)
- [ ] Gambrel
- [ ] Shed

Cladding (Exterior Wall Surfaces)

- [ ] Log
- [ ] Horizontal Wood Siding
  - Rustic/Drop [ ]
  - Clapboard [ ]
- [ ] Wood Shingle
- [ ] Board and Batten
- [ ] Vertical Board
- [ ] Asbestos/Asphalt
- [ ] Brick
- [ ] Stone
- [ ] Stucco
- [ ] Terra Cotta
- [x] Concrete/Concrete Block (both)
- [ ] Vinyl/Aluminum Siding
- [ ] Metal (specify) _____
- [ ] Other (specify) _____

Roof Material

- [ ] Wood Shingle
- [ ] Wood Shake
- [ ] Composition
- [ ] Slate
- [x] Tar/Built-up
- [ ] Tile
- [ ] Metal (specify) _____
- [ ] Other (specify) _____
- [ ] Not visible

Foundation

- [ ] Log
- [ ] Post & Pier
- [ ] Stone
- [ ] Brick
- [ ] Not visible

Concrete
- [ ] Block
- [x] Poured
- [ ] Other (specify)

Integrity (Include detailed description in **Description of Physical Appearance**)

		Intact	Slight	Moderate	Extensive
Changes to plan		[ ]	[ ]	[x]	[ ]
Changes to windows	N/A	[ ]	[ ]	[ ]	[ ]
Changes to original cladding		[x]	[ ]	[ ]	[ ]
Changes to interior		[ ]	[ ]	[x]	[ ]
Other (specify)		[ ]	[ ]	[ ]	[ ]

LOCATION SECTION

Address Building 181-B, 100 B Area
City/Town/County/Zip Code Richland/Benton County/99352
Twp 13 N **Range** 25 E **Section** 2 **I/4 Section** SE&SW **1/4 1/4 Sec** _____
Tax No./Parcel No. _____ **Acreage** _____
Quadrangle or map name Vernita Bridge, Washington Quad. - 7.5 min series 1986
UTM References Zone 11 **Easting** 298214 **Northing** 5168360
Plat/Block/Lot _____
Supplemental Map(s) _____

High Styles/Forms (Check one or more of the following)

- [ ] Greek Revival
- [ ] Gothic Revival
- [ ] Italianate
- [ ] Second Empire
- [ ] Romanesque Revival
- [ ] Stick Style
- [ ] Queen Anne
- [ ] Shingle Style
- [ ] Colonial Revival
- [ ] Beaux Arts/Neoclassical
- [ ] Chicago/Commercial Style
- [ ] American Foursquare
- [ ] Mission Revival
- [ ] Spanish Colonial Revival/Mediterranean
- [ ] Tudor Revival
- [ ] Craftsman/Arts & Crafts
- [ ] Bungalow
- [ ] Prairie Style
- [ ] Art Deco/Art Moderne
- [ ] Rustic Style
- [ ] International Style
- [ ] Northwest Style
- [ ] Commercial Vernacular
- [ ] Residential Vernacular (see below)
- [x] Other (specify) Industrial Vernacular

Vernacular House Types

- [ ] Gable Front
- [ ] Gable Front and Wing
- [ ] Side Gable
- [ ] Cross Gable
- [ ] Pyramidal/Hipped
- [ ] Other (specify) _____

NARRATIVE SECTION

Study Unit Themes (check one or more of the following)

[ ] Agriculture	[ ] Conservation	[ ] Politics/Government/Law
[ ] Architecture/Landscape Architecture	[ ] Education	[ ] Religion
[ ] Arts	[ ] Entertainment/Recreation	[ ] Science & Engineering
[ ] Commerce	[ ] Ethnic Heritage (specify) _____	[ ] Social Movements/Organizations
[ ] Communications	[ ] Health/Medicine	[ ] Transportation
[ ] Community Planning/Development	[ ] Manufacturing/Industry	[x] Other (specify) Manhattan Project and Cold War Era
	[ ] Military	[x] **Study Unit Sub-Theme(s)** Reactor Operations, Water Treatment

Statement of Significance

Date of Construction 1944 Architect/Engineer/Builder Manhattan Engineer District and duPont Company

[x] In the opinion of the surveyor, this property appears to meet the criteria of the National Register of Historic Places.

[x] In the opinion of the surveyor, this property is located in a potential historic district (National and/or local).

The 181 River Pump Houses were built on the bank of the Columbia River in each of the 100 Area Operable Units at the Hanford Site. The basic functions of the 181 Buildings were to draw water from the Columbia River for reactor cooling, emergency and fire water storage, and for sanitary water purposes. The 181-B River Pump House provided cooling water for the 100-B Reactor, the worlds first full-scale, nuclear production reactor. After 1951, the pump house also serviced the 100-C Reactor. Continuous cooling of the reactors was essential to plant operations because it would prevent a fuel meltdown and the release of fission products. The water pumps in 181-B were electric-driven and had a back up system of steam-generated pumps in case of an electrical failure. Water was withdrawn from the Columbia River at 181-B and went to the 182-B Reservoir and Pump House Facility where water would be stored for 100-B or C Reactor and emergency uses. Water from here was also routed to the 200 Areas for use in the separations and plutonium finishing plants, fire water storage, sanitary use, and general operational needs. Water on its way to the reactors would be sent from 182-B through the 183-B Filter Plant and Chemical Treatment Building. (After 1957, modifications had allowed for water to be pumped directly from 181-B to 183-B, however 182-B was still used for storage of emergency water.) In the 183-B building, water would be filtered and chemically treated so that reactor process tubes would not get soiled from impure water. From 183-B, water went to the 190-B water storage tanks and pumphouse facility and were pumped to the reactor via primary coolant pumps.

181-B has undergone some changes and modifications over the years. When the 100-C Reactor was built, the 181-B Building was enlarged to provide increased capacity for two reactors. In 1955, the pumps and pump motors within 181-B were replaced with larger and more powerful models, in order to withdraw more water.

After the shut down of B-Reactor in 1968 and C-Reactor in 1969, the 181-B Building continued to function as the water pump supporting the 200 East and West Areas as it had done since the 1940's. The 200 East and West Areas used (and continue to use) water pumped through underground water lines from 181-B for a variety of purposes. Raw water was filtered and chemically treated in the 283 Filter Plants for sanitary uses throughout the areas. Water was used in the separations and plutonium finishing plants during the processing of nuclear fuel. Fire and emergency water was also stored in the 200 Area reservoir.

The 181-B River Pump House and the water supply system at the Hanford Site was an essential component of reactor and site operations during the Manhattan Project and Cold War Eras. The production of nuclear materials relied on the reactor cooling water supply, the safety of the site and personnel relied on back up emergency water, and the success of general operations relied on sanitary water use. It is therefore the conclusion of the U.S. Department of Energy that Building 181-B is eligible for inclusion in the National Register of Historic Places under Criterion A as a contributing property within the Hanford Site Manhattan Project and Cold War Era Historic District.

Description of Physical Appearance

The 181-B building is constructed of reinforced concrete and concrete block. It was originally built as a 130 ft. by 50 ft. rectangle with the long east-west axis paralleling the Columbia River. It was 74 ft. tall on the north facade along the Columbia River and 20 ft. tall on the south (inland) facade. The roof, which is covered with built-up tar and gravel, remains flat since the difference in facade height is due to the fact that the north wall extends downward farther following the formation of the sloped shoreline. Structural steel is used on portions of the exterior of the building for support of equipment and platforms. The building contains no windows and the main access door is located on the south facade. The foundation is divided by reinforced concrete walls that form the pump wells which receive water from the river intake channels.

(See Continuation Page)

Description of Physical Appearance Continued

In 1951, the 181-B River Pump House received an addition on the east end to carry the capacity needed to supply C-Reactor, in addition to B-Reactor, with intake water. Similar construction materials were used. The addition extended the building measurements from 130 ft. to 245 ft. in length (on the east-west axis). In 1955, the pumps and pump motors within the building were replaced with larger and more powerful models in order to withdraw more water.

The operating floor of the pump house supports the various pump drives and other auxiliary equipment. The equipment was divided into three groups corresponding to the three pump wells; originally it contained only two pump wells along with vertical-type pumps located near the bottom of the wells. At the entrance flume for each well, a bar steel rack and fish screen were installed to protect fish from entering and becoming trapped. Each section has electric-driven pumps and steam-driven pumps which contribute to the pump houses total pumping capacity of 92,500 gallons per minute. Also, space was provided for an additional capacity of 17,500 gallons per minute.

The roof had openings with removable wooden covers above the pump drivers and fish screens to allow for the withdrawal of screens or shafts for maintenance or replacement. A wooden frame crane supported on flanged wheels to run along a track also was provided on the main along the entire length of the building, and extending 12 ft. beyond the east end. Four 10-ton hoists were installed on the roof above the screens, along with three barometric condensers for the steam-driven pumps. Ventilators also were placed on the roof, along with a small guard tower. The original guard tower was one room, wooden, flat-roofed, 13.5 ft. square that was accessed via a wooden staircase. The wooden guard towers and staircases were replaced in the 1960's with a metal stairway leading to the roof of 181-B.

Major Bibliographic References

Drawings: W-72014, W-72015, P-5001

E.I. du Pont de Nemours and Company. 1945. *Construction, Hanford Engineer Works: History of the Project* . HAN-10970. Wilmington, Delaware.

E.I. du Pont de Nemours and Company. 1945. *Design and Procurement History of Hanford Engineer Works and Clinton Semi-Works* . IN-6263. Wilmington, Delaware.

Gerber, M.S. 1993. *Manhattan Project Buildings and Facilities at the Hanford Site; A Construction History* . WHC-MR-0425. Westinghouse Hanford Company. Richland, Washington.

Gerber, M.S. 1993. *Summary of 100 B/C Reactor Operations and Resultant Wastes, Hanford Site* . WHC-SD-EN-RPT-004. Westinghouse Hanford Company. Richland, Washington.

Wahlen, R.K. 1989. *History of 100-B Area* . WHC-EP-0273. Westinghouse Hanford Company for the U.S. Department of Energy. Richland, Washington.